March 28, 1961 R. P. DE LISLE ET AL 2,976,879

DISPENSER FOR LAUNDRY MACHINE

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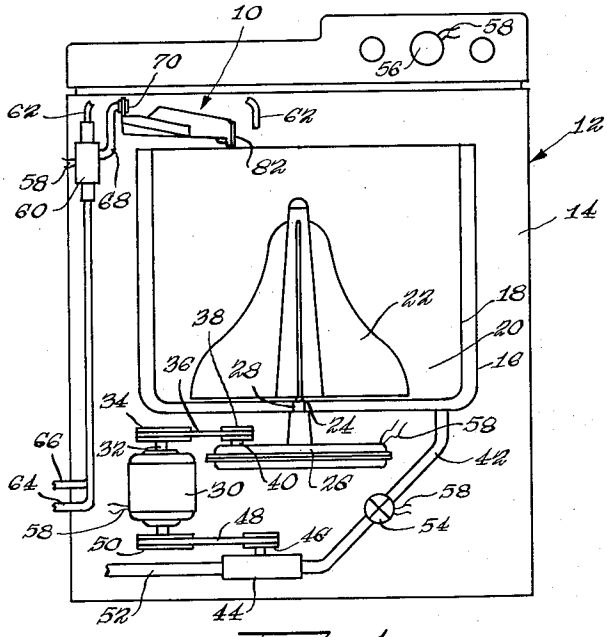


FIG. 1

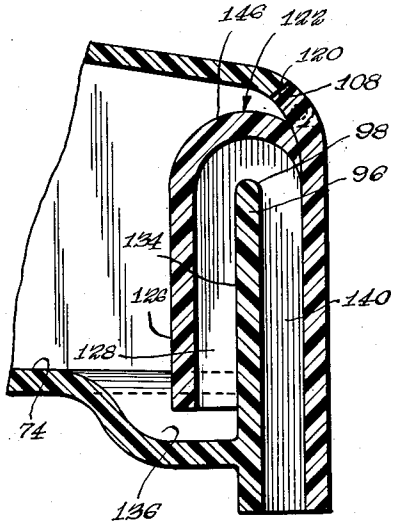


FIG. 5

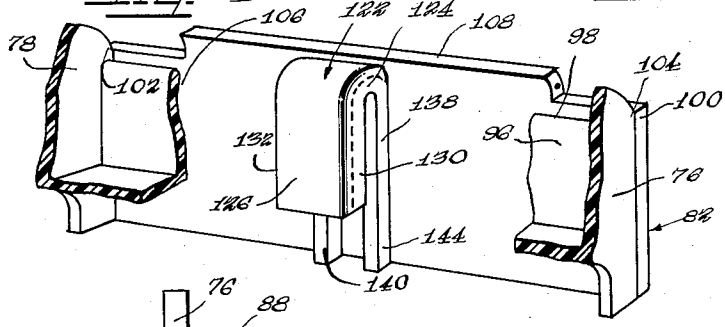


FIG. 6

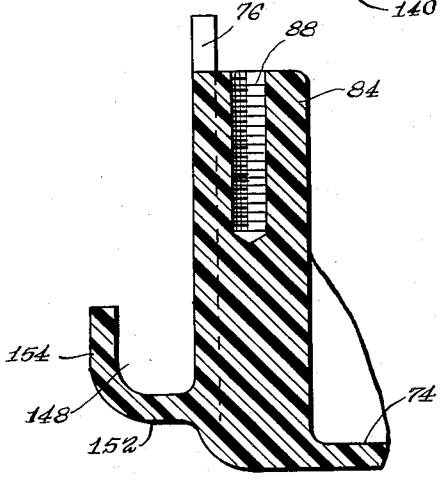


FIG. 7

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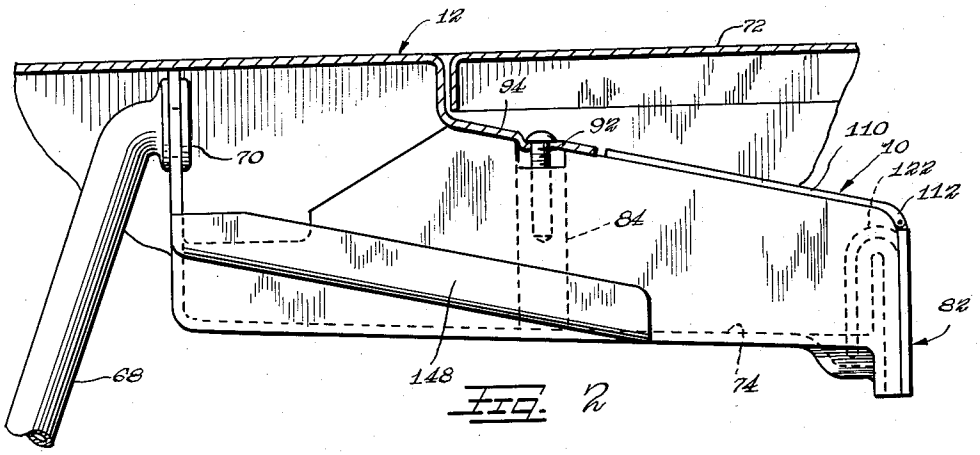


Fig. 2

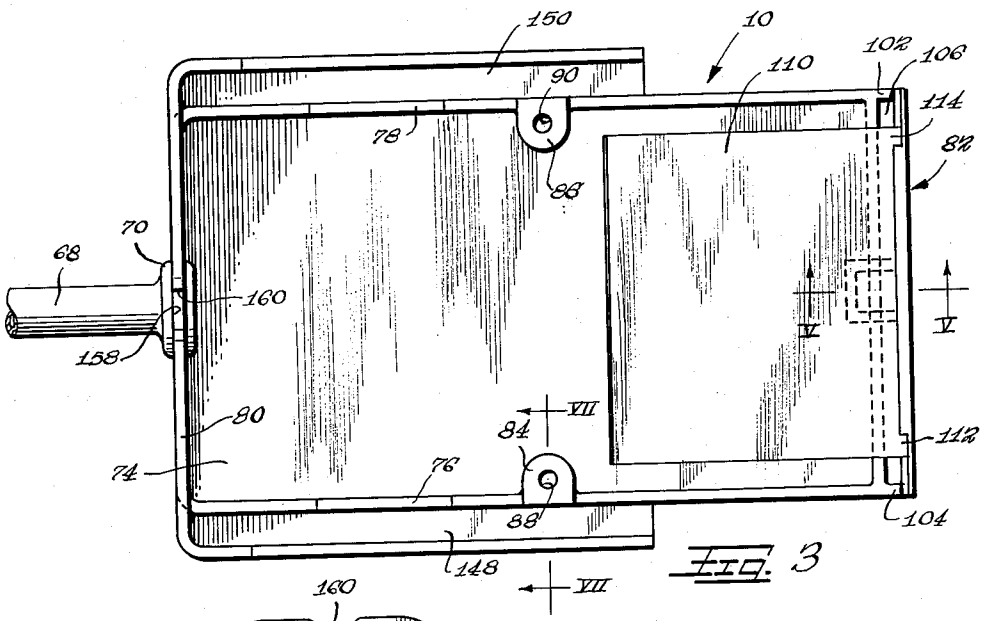


Fig. 3

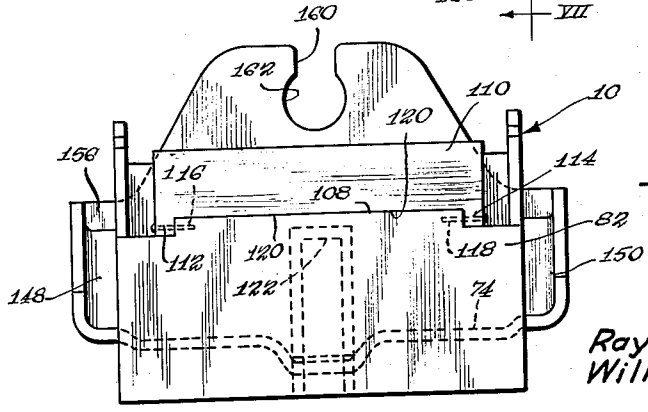


Fig. 4

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DISPENSER FOR LAUNDRY MACHINE

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1 Claim. (Cl. 137—132)

The present invention relates to improvements in washing machines or the like, to which additives or agents are added to the washing fluid.

More particularly, the invention relates to an improved laundering machine having apparatus for supplying an additive or agent to the washing fluid, and especially a rinsing additive which is automatically admixed and supplied to the washing tub or container at the proper time during the cycle or operation, and having an improved apparatus for handling and adding the rinse additive or agent.

An object of the invention is to provide in combination an automatic laundering machine with a presettable cycle control timer to operate the machine through washing, rinsing and spin-dry operation, and with an improved device for automatically admixing and adding an ingredient or agent, especially for the rinsing operation with the apparatus being controlled by the cycle control timer.

Another object of the invention is to provide an improved device for supplying additives or agents to wash water wherein an improved container is employed for containing the agent and for completely emptying the container substantially without a vestige of liquid left at the end of its operation.

Another object of the invention is to provide an improved apparatus for supplying an agent to an automatic washing machine and for mixing the agent with incoming washing fluid in an improved manner.

A further object of the invention is to provide an agent adding device for an automatic washing machine, with means such as a siphon for draining the adding mechanism, and wherein overflow of the mechanism due to improper operation of the siphon or the like will not cause fluid to run down into the operating parts of the machine, but the fluid will automatically drain into the tub of the washing machine.

A further object of the invention is to provide a tank or container for automatically supplying an additive or agent to the fluid of a laundering machine, and wherein the agent is automatically mixed with the supply of laundering fluid and the container is flushed during mixing.

A still further object of the invention is to provide a tank or container for containing and supplying an additive or agent to a washing or laundering machine, and which is provided with a siphon of improved design and improved construction for emptying the container.

Other objects and advantages will become more apparent with the teaching of the principles of the invention and with the disclosure of the preferred embodiment thereof in the specification, claim and drawings, in which:

Figure 1 is a front elevational view of an automatic laundry machine with the mechanism within the cabinet being shown somewhat schematically to illustrate the relative operation of the parts;

Figure 2 is an enlarged side elevational view of a tank or container mounted in operating position on a

washer cabinet, and embodying the principles of the present invention;

Figure 3 is a plan view of the tank for admixing and adding the agent to a laundering or washing machine;

Figure 4 is an end elevational view showing the tank for the agent to be added to the laundry machine;

Figure 5 is a vertical sectional view taken along line V—V of Figure 3, with the view having been enlarged;

Figure 6 is a perspective view, with parts broken away of the flow discharge end of the tank for the agent to be added to the laundering machine; and,

Figure 7 is an enlarged vertical sectional view taken along line VII—VII of Figure 3.

Figure 1 illustrates a tank or container **10**, for an ingredient, additive, agent or the like which is to be added to a washing fluid. The washing machine is shown in the form of an automatic washer or laundry machine **12** which is housed in a cabinet **14**. Within the cabinet is a tub **16** for containing laundering fluid to be applied to articles to be laundered. In the present instance, a clothes laundering machine is illustrated, and the clothes are contained within a basket **18** which is mounted within the tub **16**. The basket **18** is preferably perforated so that washing fluid will flow in through the perforations to engage clothes within the interior **20**, and so that washing fluid or liquid will be extracted from the clothes when the basket is spun at a relatively high speed during the spin-dry operation, after the washing and rinsing operations.

Laundering fluid is applied to the articles to be laundered by an agitator **22**. The agitator is mounted for oscillation on a support shaft **24** which is driven by a suitable gear mechanism within a gear case **26**.

The basket **18** is also rotated by power obtained from the gear case and is mounted on a shaft **28** which surrounds the shaft operating the agitator and is coaxial therewith.

For supplying power to drive the agitator, and rotate the basket, an electric motor **30** is provided. A drive shaft **32** of the motor carries a driving pulley **34**, which drives a belt **36**, which in turn passes over a pulley **38** connected to a shaft **40** leading into the gear case **26**.

Laundering fluid is drained from the tub **16** through a drain line **42** leading to the intake of a pump **44**. The pump **44** is driven by a pulley **46** on its drive shaft, and the pulley is driven by a belt **48** passing over a pulley **50** on the drive shaft at the other end of the motor **30**. The discharge from the pump leads to a drain line **52**, which may lead to a suitable drain, or to a valve controlling drain to a suds storage chamber or the like. The pump **44** may also be provided with a control valve **54** to regulate the drain flow from the tub **16**.

The operating motor **30** and the valve **54** are electrically controlled and are operated with the other automatic mechanism of the machine from a presettable cycle control timer **56**. The timer **56** operates a series of switches, and through leads **58**, controls the various elements in the predetermined sequential order. The leads **58** connect to the motor **30**, the valve **54**, and connect to control power emanating from the gear case **26** to determine operation of the agitator **22**, and the rotation of the basket **18**.

The presettable cycle control timer **56** also connects to a valve **60** which controls the flow of fluid or liquid into the tub in a manner which will be described.

Laundering fluid is supplied to the tub **16** through a first regular inlet conduit **62** which is supplied from hot and cold water lines **64** and **66**. These lines lead to the valve **60** which is a mixing valve. The mixing valve is provided with a by-pass or a like arrangement, whereby the laundering fluid may be sent through a second con-

duit 68 leading to the agent tank 10, instead of through the conduit 62. The conduit 68 terminates in an opening or a nozzle 70 which is directed across the floor of the agent tank 10 in a manner which will later be described.

As illustrated in detail in Figures 2, 3 and 4, the tank or container for the agent to be mixed with the washing fluid is secured within the appliance cabinet 12. The cabinet is provided with a cover 72 which is preferably pivoted about one edge in order that it may be moved between closed position, as shown in Figure 2, and open position wherein articles to be laundered may be inserted or removed from the basket 18.

The tank 10 has a floor 74 with walls extending upright therefrom to form a container for the agent or additive. At the sides of the tank floor 74, are side walls 76 and 78, and joining the side walls in an outer end wall 80. At the inner end 82 is a combination of walls which are constructed and function in a unique manner, as will be described.

For supporting the tank 10 in position, a pair of vertical ridges or bosses 84 and 86 project inwardly from the side walls 76 and 78. The bosses have vertical holes 88 and 90 which are threaded to receive mounting bolts 92, such as shown in Figures 2 and 7. The mounting bolts extend through openings in a downwardly sloping apron 94, which is part of the cabinet 12, and which is bent downwardly around the edge of the cabinet door 72.

The floor 74 of the tank 10 slopes downwardly. This will cause the contents to run downwardly toward the inner end 82. This end is termed the inner end, since it projects inwardly toward the center of the laundering tub 16, as illustrated in Figures 1 and 2.

An amount of additive or agent is placed in the tank 10 before the laundering cycle. The additives are preferably rinse additives which operate to condition the clothing fibers to obtain an improved condition of the clothing after the complete laundering operation.

After the laundering machine has proceeded through the washing cycle and reaches the rinse cycle, washing liquid is directed into the machine through the conduit 68, and is emitted from the nozzle end 70 in a horizontal direction to flow across the floor 74 of the tank. This will cause a uniform mixing of the liquid and the agent within the tank. The continued flow of liquid will also insure that all of the agent is washed from the floor of the tank so that none remains between laundering cycles.

The liquid and the agent will flow along the inclined floor 74 toward a flow wall 96, which is located at the inner end of the tank floor 74. The upper edge 98 of the wall extends horizontally, and when sufficient liquid is in the tank, it will rise to flow over the edge 98 of the wall in a waterfall effect, and downwardly into the tub 16.

Spaced from the flow wall 96 is an end wall 100. This end wall, as illustrated in Figure 6, is spaced from the flow wall 96 to form a flow passageway therebetween.

In construction of the tank, as illustrated in Figure 6, the flow wall 96 may be integral with the side walls 76 and 78, and the entire tank may be formed of plastic or the like. The side walls 76 and 78 project outwardly a short distance beyond the flow wall 96, and the end wall 100 is brought up against the projecting ends 102 and 104 of the side walls, and is cemented thereto to provide the flow space 106 between the walls, Figures 3 and 6.

The end wall 100 has a central raised portion 108 which is higher than the sides for connection of a cover 110. The cover 110, as illustrated in Figures 2, 3 and 4, has ears 112 and 114 through which extend hinge pins 116 and 118 to project into the sides of the central portion 108 of the end wall to hingedly mount the cover 110. With the cover supported in this manner, the cover 72 of the cabinet may be opened, and the tank 10 remains closed. Thus, clothing can be placed into the tub 16 and withdrawn without accidentally contacting the contents of the tank 10. Also, the cover 110 may be pivoted to an open position for manually adding the rinse additive, such as by pouring it into the tank with a cup. The cover is supported in closed position, Figure 4, by the surface 120 of the cover 110, which is between the ears 112 and 114, resting on the upper surface of the portion 108 of the end wall 100, or by other support means.

When the liquid in the tank rises to the elevation of the top 98 of the flow wall 96, it is siphoned out of the container by siphon conduit 122. The conduit is constructed in a unique manner, and employs the flow area between the flow wall 96 and the end wall 100, but is limited to a relatively narrow space at the center of the end of the tank.

The flow conduit employs an integral element 124 which may be of plastic or the like, and which is U-shaped, as illustrated in Figures 2, 5 and 6. One leg 126 of the U has a groove or channel 128. The sides 130 and 132 of the channel engage the surface 134 of the flow wall 96, and are cemented thereto so as to form a part of the siphon conduit in the groove 128. The floor 74 of the tank is dimpled downwardly at 136, which is located at the center of the end of the tank and forms a puddle as the tank drains so that substantially all of the liquid will be drained from the tank by operation of the siphon.

The other portion of the siphon is formed by the leg 138 of the member 122, and this leg is formed of a first and second partition 140 and 144 with the partitions extending downwardly between the flow wall 96 and the end wall 100. The partitions are cemented thereto to form a flow passageway and complete the siphon conduit. The end 146 of the U is curved so as to form a complete siphon conduit.

In the event of excessive flow into the tank, or in the event of plugging of the siphon or of the waterfall area between the flow wall 96 and the end wall 100, the tank will overflow. To prevent overflow at the outer end of the tank from running outside of the tub and damaging or corroding the operating parts, means are provided to catch the overflow and direct it into the tub.

For this purpose, safety overflow troughs 148 and 150 are provided. As may be seen in the enlarged detail of Figure 7, the troughs are integral with the side walls of the tank and project outwardly and upwardly to form the trough area. The troughs are inclined downwardly toward the tub to deliver any overflow liquid into the tub. As illustrated by the troughs 148 in Figure 7, the troughs have a short lower floor area 152 and a side wall area 154. At the rear end of the troughs is an end wall area 156, as illustrated in Figure 4.

Assembly of the agent tank with the laundry machine cabinet is easily obtained by providing the conduit 68 with an enlarged end 70 that has an annular groove 158, as illustrated in Figure 3. This annular groove slides down into a slot 160, Figure 4, which terminates in a rounded opening 162 to hold the conduit 68 in place.

In operation of the laundry machine, the operator opens the cover 72 of the cabinet, Figure 2, and lifts the cover 110 of the agent tank. A measured amount of additive or agent is poured into the tank, and the cover 110 closed. Clothes to be laundered are then inserted into the basket 18 of the laundry machine and the cover 22 is then closed. The presettable timer 56 is manually started, whereupon the washing machine automatically proceeds through its cycles of operation. For the laundering operation, the valve 60 directs the mixed flow of liquid of the proper temperature into the tub through the conduit 62, Figure 1. The agitator 22 is then operated. At the end of the washing operation, the liquid is drained through the drain line 42 by operation of the valve 54 and the pump 44. The washing operation may be followed by a number of rinse operations, and a spray of water may be delivered to the articles within the basket 18 during the preliminary rinse operations. When the deep rinse operation is reached, the control valve 60 is automatically and electrically operated to direct a by-pass flow of liquid through

the conduit 68 into the tank 10. This causes a mixing of the liquid, and the agent within the tank, and the liquid and agent will flow over the upper edge 98 of the flow wall 96, and will start liquid flowing through the siphon conduit 122. The original even flow of liquid over the horizontal edge 98 of the wall will aid in insuring a complete mixture between the agent and liquid. If the flow cannot be handled by the siphon, and the space 106 between the walls 96 and 100, overflow on the side walls 76 and 78 of the tank occurs, and this overflow is caught by the troughs 148 and 150, Figure 3, which direct the overflow liquid into the tub to prevent it from flowing down the outside of the tub to damage the operating mechanism within the cabinet. When the rinse water is shut off by action of the valve 60, the siphon conduit 122 will drain substantially all of the liquid from the tank 10, inasmuch as the liquid will run into the depression 136 at the end of the tank, and the siphon will drain most of the liquid from the depression.

Thus, it will be seen that we have provided an improved washing machine with a device for automatically supplying an agent to the machine, with the combination meeting the objectives and advantages hereinbefore set forth. The mechanism is automatic in operation, and is simplified in construction and assembly. The arrangement presents an improved siphoning means for emptying the additive tank and prevents accidents which would occur from overflow of the additive tank, thereby operating in complete safety.

We have, in the drawings and specification, presented a detailed disclosure of the preferred embodiments of our invention, and it is to be understood that we do not intend to limit the invention to the specific forms disclosed, but intend to cover all modifications, changes and alternative constructions and methods falling within the scope of the principles taught by our invention.

We claim as our invention:

A laundry machine comprising in combination a tub for a laundering fluid which is applied to articles to be laundered, an open container having a bottom and side walls for containing an agent to be added to fluid for the tub, a siphon conduit leading from the container to the tub to admix the agent with the laundering fluid and for removing and draining the contents, and an overflow trough on each of the side walls and positioned on the outside of the container to receive a flow of contents from said container in the event of filling of the container to overflow conditions, each of said troughs defining a discharge passage leading to the tub to admix the container contents with the fluid for the tub.

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